UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/058,727 | 01/28/2002 | Kadri N. Jabri | GEMS.0191/YOD (120814) | 7909 |

7590 03/28/2005

Tait R. Swanson
Fletcher, Yoder & Van Someren
P.O. Box 692289
Houston, TX 77269-2289

| EXAMINER | |
|---|---|
| ROSARIO, DENNIS | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2621 | |

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/058,727 | JABRI ET AL. | |
| | Examiner | Art Unit | |
| | Dennis Rosario | 2621 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/14/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. The following quotations of 37 CFR § 1.75(a) is the basis of objection:

> (a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

2. Claims 17,27,28,29,30,34 and 35 are objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery.

Claim 17, line 4:"man" ought to be deleted.

Claim 27, line 2:"the act of acquiring" ought to be amended to "**an** act of acquiring".

Claim 28, line 2:"the act of identifying" ought to be amended to "**an** act of identifying".

Claim 29, line 2:"the act of selecting" ought to be amended to "**an** act of selecting".

Claim 30, line 2:"the act of selecting" ought to be amended to "**an** act of selecting".

Claim 31, line 2:"the act of selecting" ought to be amended to "**an** act of selecting".

Claim 3 has the same objection of claim 28.

Claim 4 has the same objection of claim 29.

Claim 5 has the same objection of claim 30.

Claims 6 and 21 have the same objection of claim 31.

Claim 7, line 1:"the act of evaluating" ought to be amended to "**an** act of evaluating".

Claim 9, line 2:"decomposing the soft tissue and bone images" ought to be amended to" decomposing **a plurality of** soft tissue and bone images".

Claim 11 has the same objections of claim 34.

Claim 12 has the same objection of claim 11.

Claim 38, line 1:"The computer program of claim 36" ought to be amended to "The computer program of claim 37".

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhao et al. (US Patent 6,683,934 A).

Regarding claim 26, Zhao et al. discloses a method of producing soft tissue and bone images of the desired anatomy of a patient, comprising the acts of:

a) means (Fig. 3. num. 300:"1:Obtain dual images at high and low energies is part of a program in col. 8, lines 44,45 and 46.) for acquiring low and high-energy images (Fig. 3. num. 300:"1:Obtain dual images at high and low energies.) of the desired anatomy (Fig. 1, num. 50: Subject for Imaging) from a digital radiography imaging system (Fig. 1 is a system) using flat-panel detector technology (fig. 1,num. 30: Pixelated Digital x-ray detector);

b) identifying a patient size of the patient ("patient size" in col. 3, line 49, col. 4, lines 65,66 and "size of the object" in col. 5, line 8);

c) identifying a filtration setting (Fig. 1,num. 20: Internal or external filtration is set or arranged as shown in fig. 1.) for the digital radiography imaging system (fig. 1 is a system.);

d) means (fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is part of a program in col. 8, lines 44,45 and 46.) for obtaining a default decomposition parameter (The "relevant data from calibration table" of fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that fig. 3,num. 324, label:"3-B: Read relevant data from calibration table" is based on a decomposition as shown in fig. 3, label:"B: Material Decomposition.) based (via numerals 300,310 and 320) on energy levels of the low and high-energy images (Fig. 2, num.300: Obtain dual images at high and low energies is used as a basis for fig. 3,num. 320, label:"3-B: Read relevant data from calibration table".);

e) automatically producing a soft tissue decomposition parameter and a bone decomposition parameter (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" contains parameters or variables for both bone and tissue as shown in equations 8 and 9 of column 9.) by modifying (Fig. 3, num. 332: "3-B4:Use least square fit to determine the equivalent Lucite and Aluminum thickness combination" modifies a thickness.) the default decomposition parameter (The "relevant data from calibration table" of fig. 3,num. 324, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that the relevant data includes "thickness" in col. 7, line 63 that is modified to obtain the "equivalent thickness" in col. 8, lines 62,63 using fig. 3, num. 332: "3-B4:Use least square fit to determine the equivalent Lucite and Aluminum thickness combination".) based on the patient size ("thickness" in col. 7, line 63 corresponds to the size of a patient in col. 3, line 49.) and the filtration setting (The relevant data contains "filtration" in col. 7, line 64 data.); and

f) means (fig. 3,numerals 320,324,326,328,330 shown twice and 332 is part of a program in col. 8, lines 44,45 and 46.) for decomposing (fig. 3,numerals 320,324,326,328,330 shown twice and 332 are a series of decomposing processes.) soft tissue and bone images of the desired anatomy (Fig. 3,num. 310:"2: (conventional) Preprocessing of each image (e.g., gain correction)" are images of fig. 1, num. 50: Subject for Imaging that will be decomposed using fig. 3,numerals 320,324,326,328,330 shown twice and 332.) from the low and high-energy images (Fig. 3. num. 300:"1:Obtain dual images at high and low energies.) using the soft tissue and bone decomposition parameters (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" contains parameters or variables for both bone and tissue as shown in equations 8 and 9 of column 9.) to perform a log-subtraction dual-energy decomposition computation (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or /bone/calcification images" contains parameters or variables for both bone and tissue as shown in equations 8 and 9 of column 9. Note that fig. 3, num. 330 is part of a decomposition process that is based on log-subtraction as shown by equation (3) in column 5.).

Regarding claim 36, Zhao et al. discloses a computer program for automatically providing decomposition parameters for decomposing soft tissue and bone images from low and high-energy images acquired from a digital radiography imaging system, comprising:

a) a tangible medium configured to support machine-readable code (fig. 1,num. 40:" Computer(s)"); and

b) machine-readable code ("computer program" in col. 8, line 46) supported on the medium (fig. 1,num. 40:" Computer(s)") and including:

b1) a routine (fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a part of the computer program.) for obtaining a default decomposition parameter (The "relevant data from calibration table" of fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is based on numerals 300 and 310.) on energy levels of the low and high-energy images (Fig. 2, num.300: Obtain dual images at high and low energies is used as a basis for fig. 3,num. 320, label:"3-B: Read relevant data from calibration table".); and

b2) a routine (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" is a part of the computer program.) for automatically providing a soft tissue decomposition parameter and a bone decomposition parameter (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" contains parameters or variables for both bone and tissue as shown in equations 8 and 9 of column 9.) by modifying (Fig. 3, num. 332: "3-B4:Use least square fit to determine the equivalent Lucite and Aluminum thickness combination") the default decomposition parameter (The "relevant data from calibration table" of fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that the relevant data includes "thickness" in col. 7, line 63 that is modified to obtain the "equivalent thickness" in col. 8, lines 62,63 using fig. 3, num. 332: "3-B4:Use least square fit to determine the equivalent Lucite and Aluminum thickness combination".) based on the patient size("thickness" in col. 7, line 63 corresponds to the size of a patient in col. 3, line 49.) and the filtration setting (The relevant data contains "filtration" in col. 7, line 64 data.) of the digital radiography imaging system (fig. 1 is a system).

Claims 1 and 15 are rejected the same as claim 26. Thus, argument similar to that presented above for claim 26 is equally applicable to claims 1 and 15.

Regarding claims 31 and 40, Zhao et al. discloses the method of claim 26 and the computer program of claim 36, wherein the act of and routine (fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a part of the computer program in col. 8, lines 43,44,46.) for obtaining the default decomposition parameter (The "relevant data from calibration table" of fig. 3,num. 324, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that fig. 3,num. 324, label:"3-B: Read relevant data from calibration table" is based on a decomposition as shown in fig. 3, label: "B: Material Decomposition.) comprises:

a) [the] **an** act of and routine (fig. 3,num. 324, label:"3-B: Read [or selecting] relevant data from calibration table" is part of the computer program.) for selecting the default decomposition parameter from a parameter table (The "relevant data from calibration table" of fig. 3,num. 324, label:"3-B: Read [or selecting] relevant data from calibration table" is a default decomposition parameter.) comprising a plurality of default decomposition parameters (col. 7, lines 60-67 lists parameters contained in the table 324 of fig. 3.), each corresponding to a low-energy level ( "low...energies" in col. 7, lines 65,66) of the first energy image (Fig. 3. num. 300:"1:Obtain dual images at high and low energies.) and to a high-energy level ("high energies" in col. 7, lines 65,66) of the second energy image (Fig. 3. num. 300:"1:Obtain dual images at high and low energies.).

Regarding claim 32, Zhao et al. discloses the method of claim 26, comprising the acts of:

a) an image enhancement routine/means for interactively (Fig. 3,num. 330 is part of the computer program in col. 8, lines 44,45 and 46.) for modifying at least one parameter ("parameter $\phi$" in col. 6, line 48 is modified with math operations in equations (5) or (8) or (9).) of the soft tissue and bone decomposition parameters (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" contains parameters or variables for both bone and tissue as shown in equations 8 and 9 of column 9.) to improve image clarity ("producing a desired anatomy" in col. 6, lines 50,51.) of at least one image of the soft tissue ("producing a desired anatomy (soft tissue) image" in col. 6, lines 50,51.) and bone images interactively ("producing a desired anatomy (soft tissue) image" in col. 6, lines 50,51 can be "displayed" in col. 6, line 54.); and

b) a system update routine/means (Fig. 3,num. 330 is part of the computer program in col. 8, lines 44,45 and 46.) for automatically modifying (Equation (8) automatically modifies since it includes match operations that modify.) at least one system default (The "relevant data from calibration table" of fig. 3,num. 324, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that the relevant data includes "thickness" in col. 7, line 63 also shown as "$(Lucite)_i$ " in equation (8) of column 9 that is modified with "$b_i$".) based on modifications ("parameter $\phi$" is modified with math operations in equations (5) or (8) or (9).) to the at least one parameter ("parameter $\phi$" in col. 6, line 48).

Regarding claim 33, Zhao et al. discloses the method of claim 32, wherein the act of modifying at least one parameter ("parameter $\phi$" in col. 6, line 48 is modified with math operations in equations (5) or (8) or (9).) comprises:

a) the act of interactively improving ("displayed" in col. 6, line 54 produces a "desired... image" in col. 6, lines 50,51.) the at least one image ("producing a desired anatomy (soft tissue) image" in col. 6, lines 50,51.) by modifying the at least one parameter ("parameter $\phi$" in col. 6, line 48 is modified with math operations in equations (5) or (8) or (9).) using a sliding scale ("angles" in col. 9, line 16 contains a plurality of angles which makes a scale for selecting an angle or parameter "$\phi$".).

Regarding claim 45, Zhao et al. discloses a medical imaging system, comprising:

a) a digital radiographic imaging system, comprising:

a1) an x-ray device (fig. 1,num. 10: Dual Energy X-ray Tube Generator) adapted to generate x-rays (fig. 1, label: X-rays);

a2) a collimator (fig. 1,num. 20: Internal or external filtration) adapted to filter the x-rays (Fig. 1: X-rays) in a desired anatomical region of a patient (Fig. 1,num. 50: Subject for Imaging);

a3) a flat-panel digital x-ray detector (fig. 1,num. 30: Pixelated Digital x-ray detector) adapted to detect x-rays passing through the patient (Fig. 1,num. 50: Subject for Imaging); and

a4) dual-energy control circuitry adapted to acquire low and high-energy images of the desired anatomical region(fig. 1,num. 30: Pixelated Digital x-ray detector and fig. 1,num. 40: Computer(s) "acquire dual energy...images of a subject 50...(col. 3, lines 7-9).") over a time interval ("rapid succession" in col. 3, line 13); and

b) an image processing system (fig. 1,num. 40: Computer(s)), comprising:

b1) an automatic decomposition parameter selection module (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" is a part of the computer program.) adapted to compute soft tissue and bone decomposition parameters (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" computes decomposition parameters using equations.) by modifying (Fig. 3, num. 332: "3-B4:Use least square fit to determine the equivalent Lucite and Aluminum thickness combination") the default decomposition parameter (The "relevant data from calibration table" of fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that the relevant data includes "thickness" in col. 7, line 63 that is modified to obtain the "equivalent thickness" in col. 8, lines 62,63 using fig. 3, num. 332: "3-B4:Use least square fit to determine the equivalent Lucite and Aluminum thickness combination".) based on the patient size ("thickness" in col. 7, line 63 corresponds to the size of a patient in col. 3, line 49.) and the filtration setting (The relevant data contains "filtration" in col. 7, line 64 data.) of the collimator (fig. 1, num .20: Internal or external filtration); and

b2) a dual-energy image decomposition module (fig. 3,numerals 320,324,326,328,330 shown twice,332 is a module.) adapted to decompose (fig. 3,numerals 320,324,326,328,330 shown twice,332 is a series of decomposing processes.) soft tissue and bone images of the desired anatomy (Fig. 3,num. 310:"2: (conventional) Preprocessing of each image (e.g., gain correction)" are images of fig. 1, num. 50: Subject for Imaging.) from the low and high-energy images (Fig. 3. num. 300:"1:Obtain dual images at high and low energies.) using the soft tissue and bone decomposition parameters (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" contains parameters or variables for both bone and tissue as shown in equations 8 and 9 of column 9.).

Regarding claim 48, Zhao et al. discloses a system for decomposing soft tissue and bone images from low and high-energy images acquired by a digital radiography imaging system, comprising:

a) means (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images".) for automatically providing a soft tissue decomposition parameter and a bone decomposition parameter (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" computes decomposition parameters using equations that have parameters.) based on a default decomposition parameter (The "relevant data from calibration table" of fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is based on a decomposition as shown in fig. 3, label: "B: Material Decomposition.), a patient size ("thickness" in col. 7, line 63 corresponds to the size of a patient in col. 3, line 49.) and a collimator filtration setting (The relevant data contains "filtration" in col. 7, line 64 data.).

Regarding claims 28,37 and 49, Zhao et al. discloses the method of claim 26 and routine of claim 37 and the system of claim 48, wherein the act of identifying the patient size ("patient size" in col. 3, line 49, col. 4, lines 65,66 and "size of the object" in col. 5, line 8) comprises [the] **an** act of and a routine/means (Fig. 3,num. 324 in col. 7, line 59 is part of a computer program in col. 8, lines 43,44,46.) for identifying("correlate[ing]") in col. 7, line 62) a size category ("maximum thickness" in col. 8, line 8 or "thickness" in col. 8, line 10 is determined based on a "subject" in col. 8, line 10.) for the patient.

Regarding claims 29 and 38, Zhao et al. discloses the method of claim 28 and the computer program of claim **37**, wherein the act of identifying the patient size ("patient size" in col. 3, line 49, col. 4, lines 65,66 and "size of the object" in col. 5, line 8) comprises [the] **an** act of and a routine (Fig. 3,num. 324 in col. 7, line 59 is part of a computer program in col. 8, lines 43,44,46.) for selecting ("final selection" in col. 8, line 9) a patient size offset factor ("fine steps" in col. 8, line 2) based on the size category ("maximum thickness" in col. 8, line 8 or "thickness" in col. 8, line 10 is determined based on a "subject" in col. 8, line 10.).

Regarding claims 30,39 and 50, Zhao et al. discloses the method of claim 26 and the computer program of claim 36 and the system of claim 48, wherein the act of identifying the filtration setting (Fig. 1,num. 20: Internal or external filtration is set or arranged as shown in fig. 1.) comprises [the] **an** act of and routine/means (Fig. 3,num. 324 in col. 7, line 59 is part of a computer program in col. 8, lines 43,44,46.) for selecting a filtration offset factor ("fine steps" in col. 8, line 2 is based on a "thickness range" in col. 4, line 65 "which is selected, for each filter...(col. 4, lines 64,65)." Thus the fine steps are selected for each filter of fig. 1.) based on the filtration setting (Fig. 1,num. 20: Internal or external filtration is set or arranged as shown in fig. 1.).

Regarding claim 2, Zhao et al. discloses the method of claim 1, wherein the act of identifying the energy levels (Fig. 3. num. 300:"1:Obtain dual images at high and low energies.) comprises the acts of:

a) identifying (Fig. 1, num. 30 is a detector "take[s]" in col. 6, line 9 or identifies "high and low... images" in col. 6, line 8.) a low-energy level for the first energy image (Fig. 3. num. 300 obtains an image at a high energy.); and

b) identifying (Fig. 1, num. 30 is a detector "take[s]" in col. 6, line 9 or identifies "high and low... images" in col. 6, line 8.) a high-energy level for the second energy image (Fig. 3. num. 300 obtains an image at a low energy.).

Claims 3 and 18 are rejected the same as claim 28. Thus, argument similar to that presented above for claim 28 is equally applicable to claims 3 and 18.

Claims 4 and 19 are rejected the same as claim 29. Thus, argument similar to that presented above for claim 29 is equally applicable to claims 4 and 19.

Claims 5 and 20 are rejected the same as claim 30. Thus, argument similar to that presented above for claim 30 is equally applicable to claims 5 and 30.

Claims 6 and 21 are rejected the same as claim 31. Thus, argument similar to that presented above for claim 31 is equally applicable to claims 6 and 21.

Regarding claim 7, Zhao et al. discloses the method of claim 1, comprising [the] **an** act of evaluating the energy levels against energy range restrictions as mentioned in col. 3, lines 25-31.

Regarding claim 8, Zhao et al. discloses the method of claim 7, wherein the act of automatically providing the soft tissue and bone decomposition parameters (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" contains parameters or variables for both bone and tissue as shown in equations 8 and 9 of column 9.) is performed only (A safety feature in col. 4, lines 3-5 restricts the range as mentioned in col. 3, lines 25-31.Thus, if the safety feature was not used the device of fig. 1 is unsafe for performing operations.) if the energy levels (Fig. 3. num. 300:"1:Obtain dual images at high and low energies.) are within the energy range restrictions as mentioned in col. 3, lines 25-31.

Regarding claims 9 and 41, Zhao et al. discloses the method of claim 1 and the computer program of claim 36, comprising the acts of:

a) a decomposition routine (fig. 3,numerals 320,324,326,328,330 shown twice and 332 are a series of decomposing processes that is part of the computer program in col. 8, lines 44,45 and 46.) for decomposing (fig. 3,numerals 320,324,326,328,330 shown twice and 332 are a series of decomposing processes.) [the] **a plurality of** soft tissue and bone images (fig. 3,num. 300 contains images of soft tissue and bones.) based on the soft tissue and bone decomposition parameters (Fig. 3, num. 330, label:"3-B5: Use Equations 8 and 9 to obtain soft-tissue and or/bone/calcification images" contains parameters or variables for both bone and tissue as shown in equations 8 and 9 of column 9.); and

The remaining limitations were addressed in claim 32.

Claim 22 is rejected the same as claim 32. Thus, argument similar to that presented above for claim 32 is equally applicable to claim 22.

Claims 10 and 23 are rejected the same as claim 33. Thus, argument similar to that presented above for claim 33 is equally applicable to claims 10 and 23.

Regarding claims 35 and 44, Zhao et al. discloses the method of claim 32 and the computer program of claim 41, wherein the act of automatically modifying (Equation (8) automatically modifies since it includes match operations that modify.) the at least one system default (The "relevant data from calibration table" of fig. 3,num. 324, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that the relevant data includes "thickness" in col. 7, line 63 also shown as "$(Lucite)_i$ " in equation (8) of column 9 that is modified with "$b_i$".) and the system update routine (Fig. 3,num. 330 is part of the computer program in col. 8, lines 44,45 and 46.) comprises:

a) a default parameter modification routine ("search/fit algorithm") for modifying ("interpolating" in col. 6, line 26) a default decomposition parameter table (Parameters of the "table" of fig. 3,num. 320 are interpolated in col. 6, lines 23-25.) for the default decomposition parameter (The "relevant data from calibration table" of fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that fig. 3,num. 324, label:"3-B: Read relevant data from calibration table" is based on a decomposition as shown in fig. 3, label: "B: Material Decomposition.).

Claims 34 and 43 is rejected the same as claims 35 and 44, respectively. Thus, argument similar to that presented above for claims 35 and 44 is equally applicable to claims 34 and 43.

Claims 11 and 24 are rejected the same as claim 34. Thus, argument similar to that presented above for claim 34 is equally applicable to claims 11 and 24.

Claims 12 and 25 are rejected the same as claim 35. Thus, argument similar to that presented above for claim 35 is equally applicable to claims 12 and 25.

Claim 13 is rejected the same as claim 29. Thus, argument similar to that presented above for claim 29 is equally applicable to claim 13.

Claim 14 is rejected the same as claim 30. Thus, argument similar to that presented above for claim 30 is equally applicable to claim 14.

Regarding claim 27, Zhao et al. discloses the method of claim 26, wherein the act of acquiring the low and high-energy images (Fig. 3. num. 300:"1:Obtain dual images at high and low energies.) of the desired anatomy (Fig. 1, num. 50: Subject for Imaging) comprises [the] **an** act of acquiring low and high-energy chest images (Figs. 5A,5B,6A and 6B are chest images) over a time interval ("sufficient time" in col. 7, line 5).

Claim 16 is rejected the same as claim 27. Thus, argument similar to that presented above for claim 27 is equally applicable to claim 16.

Regarding claim 17, Zhao et al. discloses the method of claim 15, wherein the act of obtaining the default decomposition parameter comprises the acts of:

a) identifying a low-energy level for the first energy image (as mentioned in col. 3, lines 25-31);

b) identifying a high-energy level for the second energy image (as mentioned in col. 3, lines 25-31); [man]

c) selecting ("final selection" in col. 8, line 9) the default decomposition parameter (The final selection corresponds to the "relevant data from calibration table" of fig. 3,num. 320, label:"3-B: Read relevant data from calibration table" is a default decomposition parameter. Note that fig. 3,num. 324, label:"3-B: Read relevant data from calibration table" is based on a decomposition as shown in fig. 3, label:"B: Material Decomposition.) based on both the low and high-energy levels (as mentioned in col. 3, lines 25-31 and in col. 7, lines 65,66.).

Regarding claim 42, Zhao et al. discloses the computer program of claim 41, wherein the image enhancement routine (Fig. 3,num. 330 is part of the computer program in col. 8, lines 44,45 and 46.) comprises an interactive slider mechanism (fig. 1,num. 70: Display unit allows viewing of images that can be modified.) adapted to interactively improve the at least one image ("producing a desired anatomy (soft tissue) image" in col. 6, lines 50,51.) by re-decomposing ("recombining" in col. 9, line 3 of decomposed images.) the at least one image ("(soft tissue) image" in col. 6, lines 50,51.) using the modified at least one parameter ("parameter $\phi$" in col. 6, line 48 is modified with math operations in equations (5) or (8) or (9) is used to modify images using the display unit 70 of fig. 1.).

Claim 46 is rejected the same as claim 41. Thus, argument similar to that presented above for claim 41 is equally applicable to claim 46.

Claim 47 is rejected the same as claim 44. Thus, argument similar to that presented above for claim 44 is equally applicable to claim 47.

Claim 51 is rejected the same as claim 26, paragraph d. Thus, argument similar to that presented above for claim 26, paragraph d is equally applicable to claim 51.

Claim 52 is rejected the same as claim 26, paragraph f. Thus, argument similar to that presented above for claim 26, paragraph f is equally applicable to claim 52.

Claim 53 is rejected the same as claim 26, paragraph a. Thus, argument similar to that presented above for claim 26, paragraph a is equally applicable to claim 53.

Claim 54 is rejected the same as claim 32, paragraph a. Thus, argument similar to that presented above for claim 26, paragraph a is equally applicable to claim 54.

Claim 55 is rejected the same as claim 32, paragraph b. Thus, argument similar to that presented above for claim 32, paragraph b is equally applicable to claim 55.

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hu (US Patent 5,473,655) is pertinent as teaching a method of decomposing an image as shown in fig. 5,numeral 104 with parameters, 95.

Seibert et al., IEEE article, discloses a method of decomposing bone and tissue images with high and low energies.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is 703-305-5431. The examiner can normally be reached on 6-3.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 703-308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DR
Dennis Rosario
Unit 2621

BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600